

The Smart Factory: Robots lend a helping hand

Operating and administering some 113 plants and depots worldwide constantly challenges CNH Industrial's global Manufacturing and Aftermarket Solutions (AMS) team to devise new ways of working to best support and supply parts to dealers, distributors and customers. The team is particularly attuned to the physical demands of the job in the warehouse environment.

"Think about all the movements you make when you're gathering together a list of items from the shelves in a warehouse," says Peter Ommeslag, Head of Industry 4.0 at CNH Industrial. "You reach, you bend, you stretch. If something is just out of reach, you stretch a little bit further."



Ergonomics aside, the tasks themselves are varied and numerous. CNH Industrial's parts depots and parts delivery systems provide customers with access to the full range of parts required to support the Company's vast product portfolio across 12 brands.

Robots and intelligent vehicles are assisting workers with much of the heavy lifting in factories and warehouses, reducing the risk of injuries and improving the wellbeing of employees. Thanks to the introduction of intelligent robots and vehicles, the work has become both safer and less strenuous.

In Brescia, Italy, for example, employees are now operating alongside custom-built "cobots" (from the words "collaborative" and "robot"). Meanwhile, in Valladolid, Spain, automated guided vehicles (AGVs) have recently started carrying out tasks.

Industry 4.0 in action

Both the cobots and AGVs are part of CNH Industrial's move to embrace the digitalization of manufacturing, referred to as Industry 4.0. Industrialization began with mechanization through water and steam power; it evolved with the use of electricity in mass production and accelerated throughout the second half of the 20th century with the adoption of computers and the internet. Now digital technologies, including machine learning and artificial intelligence, promise to, once again, revolutionize the nature of industrial work.

Ommeslag says these new technologies have been introduced for many reasons, but wants to highlight two specific ones: "We want to minimize the risk to workers and also

improve their physical wellbeing. Both the cobots and the AGVs reduce the potential for accidents, while also decreasing the physicality of day-to-day work. It's a really exciting technology."

He says that his department and projects are dedicated to enabling savings and more effective processes. "Efficiency is the main focus of our activity, but we also consider other aspects to make jobs even easier and to change the way we go about manufacturing, introducing new technologies, a new culture, and new skills into our production lines."

Automated guided vehicles – less risk, more productivity

At the IVECO commercial vehicles manufacturing facility in Valladolid, Spain, AGVs have been equipped with cameras, sensors and artificial intelligence enabled software. They are able to transport items weighing between 10kg (22lb) and 20kg (44lb) and move at around 5 kilometers (3 miles) per hour.

"The role of AGVs is to move goods from A to B by the quickest route. They know exactly where to pick up the required piece of material, and where to take it on the production line," explains Rafael Herrero, a member of the Industry 4.0 Operational Committee. "Within the plant, they don't have to travel more than a few hundred meters at any given time, but they could go as far as you want."

Thanks to their advanced software, the AGVs are able to identify risks, stopping immediately if they sense any kind of hazard or obstacle. The cameras and sensors also ensure that the vehicles don't collide with humans or other pieces of equipment.

"The focus isn't really on speed," says Ommeslag. "A man with a trolley could go at the same speed as these vehicles. The difference is that the machine doesn't get tired." The focus is on assisting employees with tasks that are physically demanding and repetitive.

Cobots – safe and intuitive

In Brescia, in northern Italy, cobots are already at work assisting in the Company's warehouses. Thanks to their long flexible arm, they can select the required items and transfer them all to an employee's work station. That individual can then assemble what

is needed while comfortably seated, without constantly having to move between their desk and the warehouse to obtain the required parts, saving them time and energy.

“Like the AGVs, the cobots are brilliant at reducing the physical strain on workers,” says Herrero. “The warehouses are big, and our team members have a significant amount of terrain to cover over the course of the day, which can be tiring. We’ve found that using cobots substantially minimizes the previous difficulties our staff endured. They can also be used by employees with disabilities and those using wheelchairs, which is great.”

Herrero also points out that with retirement ages set to increase, the cobots will allow people to work longer and more safely. “They are a very intuitive technology, so people don’t need extra training.”

As the technology continues to evolve, Ommeslag notes that cobots have huge potential for learning new skills in the future. “The cobots already have an intelligent ‘skin’, which allows them to learn new tasks,” he says. “If a human shows the cobot the required movement, the cobot will remember it. The pace of change is remarkable.”

Crucially, the cobots are much safer to use than ordinary robots. “These cobots are far more sophisticated. They come to an immediate halt if they sense the presence of a human,” says Herrero.

At present, the cobots are already in operation in Brescia, Madrid, and at other locations. Opportunities for future rollout are currently actively being analyzed at the Company’s global locations.

“We could potentially have 25 or 50 cobots in each plant,” says Herrero. “This will reduce the need for forklifts and trolleys. Cobots will revolutionize manufacturing.”

Although the word “robot” evokes images of R2-D2 from the science-fiction franchise “Star Wars”, the definition, as provided by the Robot Institute of America in 1979, is, “A reprogrammable, multifunctional manipulator designed to move material, parts, tools or specialized devices through various programmed motions for the performance of a variety of tasks”. Today, this remains an accurate definition of how the robots, in daily use throughout CNH Industrial’s factories, depots and warehouses, assist the global workforce. They are now an integral part of the Company’s manufacturing process, vital tools in the drive to increase safety, efficiency and improve the wellbeing of its employees across the globe.

